

**What is claimed is:**

1. A constant power control circuit for an electrosurgical generator having a power selection system that produces a control voltage signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes, the constant power control circuit comprising:

a current sampling circuit inductively coupled to one output electrode,  
the current sampling circuit producing a sampled current signal proportional to the  
10 average current flowing through the output electrode;

a linear conversion circuit electrically connected to the current sampling circuit for generating a linear converted signal, wherein the linear conversion circuit includes;

15 reference signal; a linear multiplier generating means for generating a multiplier

a linear offset generating means for generating an offset reference signal;

a multiplier, electrically connected to the linear multiplier generating means, for multiplying the sampled current signal and the multiplier reference signal to produce a multiplied signal; and

a summer, electrically connected to the linear offset generating means, for summing the offset reference signal and the multiplied signal to produce the linear converted signal; and

25 a feedback correction circuit electrically connected to receive the linear converted signal from the linear conversion circuit and the control voltage signal from the power selection system for producing a feedback control signal which is supplied to the power selection system to control the amount of electrosurgical energy created, wherein the feedback correction circuit includes:

30 a subtractor, electrically connected to receive the linear converted signal and the control voltage signal, for determining a difference in amplitude between the control voltage signal and the linear converted signal and producing a delta signal proportional to the difference; and

2. The constant power control circuit for an electrosurgical generator  
5 having a power selection system that produces a control voltage signal to control a  
high voltage direct current supply which supplies a high voltage signal to an output  
switching radio frequency stage thereby creating an electrosurgical energy between  
two output electrodes of Claim 1, wherein the output switching radio frequency  
stage has a primary transformer winding, and wherein the feedback correction circuit  
10 further includes:

a connector for electrically connecting the feedback correction circuit to the primary transformer winding;

20 a reducer, electrically connected to receive the high impedance detection signal and the feedback control signal, for reducing the amplitude of the feedback control signal when the high impedance detection signal indicates that the voltage across the primary transformer winding is greater than the high impedance reference signal.

30 a maximum control voltage reference generator, electrically connected to receive the control voltage signal, for generating a maximum control voltage reference signal; and

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5. A constant power control circuit for an electrosurgical generator having a power selection system that produces a control voltage signal to control a high

5 transformer winding, and wherein the constant power control circuit comprises:

a current sampling circuit inductively coupled to one output electrode, the current sampling circuit producing a sampled current signal proportional to the average current flowing through the output electrode;

10 a linear conversion circuit electrically connected to the current sampling circuit for generating a linear converted signal, wherein the linear conversion circuit includes;

a linear multiplier generating means for generating a plurality of unique multiplier reference signals, wherein there is one multiplier reference signal for each operational mode;

15                    a linear offset generating means for generating a plurality of unique offset reference signals, wherein there is one offset reference signal for each operational mode;

a plurality of multipliers, electrically connected to the linear multiplier generating means and to receive the sampled current signal, wherein there is one multiplier for each operational mode and each multiplier multiplies the sampled current signal and the unique multiplier reference signal associated with one operational mode to produce a unique multiplied signal for that operational mode;

25 a plurality of summers, electrically connected to the linear offset generating means and to each multiplier, wherein there is one summer for each operational mode and each summer sums the offset reference signal associated with one operational mode and the unique multiplied signal associated with that operational mode to produce a unique linear converted signal for that operational mode;

30 a mode monitor, electrically connected to the power selection system,  
for identifying the operational mode and producing an identified operational mode  
signal;

a signal selector, electrically connected to receive the identified operational mode signal and the unique linear converted signal from each of the

summers, for selecting the unique linear converted signal associated with the identified operational mode, and causing that linear converted signal to be supplied to the feedback correction circuit; and

5 a feedback correction circuit electrically connected to receive the linear converted signal from the linear conversion circuit and the control voltage signal from the power selection system for producing a feedback control signal which is supplied to the power selection system to control the amount of electrosurgical energy created, wherein the feedback correction circuit includes:

10 a subtractor, electrically connected to receive the linear converted signal and the control voltage signal, for determining a difference in amplitude between the control voltage signal and the linear converted signal and producing a delta signal proportional to the difference;

15 an adder, electrically connected to receive the delta signal and the control voltage signal, for adding the delta signal to the control voltage signal and producing the feedback control signal;

a maximum control voltage reference generator, electrically connected to receive the control voltage signal, for generating a maximum control voltage reference signal;

20 a switcher, electrically connected to receive the maximum control voltage reference signal and the feedback control signal, for substituting the maximum control voltage reference signal for the feedback control signal when the feedback control signal is greater in amplitude than the maximum control voltage reference signal

25 a high impedance reference generator, electrically connected to receive the control voltage signal, for generating a high impedance reference signal;

a connector for electrically connecting the feedback correction circuit to the primary transformer winding;

30 a comparator, electrically connected to the connector and to receive the high impedance signal, for comparing the amplitude of the high impedance reference signal to the voltage across the primary transformer winding and producing a high impedance detection signal; and

a reducer, electrically connected to receive the high impedance detection signal and the feedback control signal, for reducing the amplitude of the

6. A method for maintaining a generally constant output power from an electrosurgical generator having a power selection system that produces a control voltage signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes, the method including the steps of:

7. The method for maintaining a generally constant output power from an electrosurgical generator having a power selection system that produces a control voltage signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes of Claim 6, wherein the output

7. The method for maintaining a generally constant output power from an electrosurgical generator having a power selection system that produces a control voltage signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes of Claim 6, wherein the output

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connecting to the primary transformer winding;

reducing the amplitude of the feedback control signal when the voltage across the primary transformer winding is greater than the high impedance reference signal.

8. The method for maintaining a generally constant output power from an electrosurgical generator having a power selection system that produces a control signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes of Claim 6, the method further comprising the steps of:

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substituting the maximum control voltage reference signal for the feedback control signal when the feedback control signal is greater in amplitude than the maximum control voltage reference signal.

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9. The method for maintaining a generally constant output power from an electrosurgical generator having a power selection system that produces a control voltage signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes of Claim 6, wherein the power selection system has a plurality of operational modes and wherein the method further includes the steps of:

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generating a plurality of unique linear multiplier reference signals, one for each operational mode;

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generating a plurality of unique linear offset reference signals, one for each operational mode;

multiplying the sampled current signal, separately and concurrently, with each of the unique multiplier reference signals to produce a plurality of unique multiplied signals, one for each operational mode;

connecting to the power selection system to identify the operational  
5 mode selected;

causing that linear converted signal to be supplied to the feedback correction circuit.

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